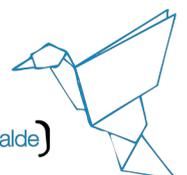


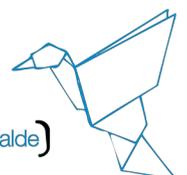
Postdoctoral Fellowship in Statistical Physics

Job Offer	
Topics:	Stochastic Modelling for Complex Systems
Summary of the research program:	<p>The improvement of experimental devices in the last years led to a dramatic increase of experimental achievements in the study of biological systems. Unexpected behaviours were disclosed and new challenges emerged for their understanding calling for new experimental, modelling and theoretical methods.</p> <p>The research will be focused on the development of stochastic processes for modelling anomalous diffusion in complex systems. In particular, the approach that it is intended to be developed is based on randomly scaled Gaussian processes, namely each simulated trajectory is given by a Gaussian process times a scale that results to be distributed according a proper population. This approach is compatible with the dynamics of a heterogeneous ensemble of Brownian particles where the population of the scale codes the heterogeneity of the ensemble. Hence, beside established approaches as the continuous time random walk or fractional Brownian motion, the classical Langevin equation will be also considered for the formulation of a stochastic dynamics generating anomalous/fractional diffusion. This construction on the basis of the Langevin equation provides a dynamical framework that allows for discussing the model with physical perspectives.</p> <p>The research will be conducted in view of a multidisciplinary collaboration involving physicists, applied mathematicians and biologists by combining mathematical modelling and experimental measurements. In this respect, the research is expected to include also data analysis as well as the execution of very recent algorithms for classifying experimental trajectories by providing the discrimination among diffusion models, the classification between normal and anomalous diffusion, and the estimation of the characterizing parameters.</p> <p>Recent papers by the group: Sliusarenko O., Vitali S., Sposini V., Paradisi P., Checkkin A., Castellani G., Pagnini G., Finite-energy Lévy-type motion through heterogeneous ensemble of Brownian particles. J. Phys. A: Math. Theor. 52, 095601 (2019) D'Ovidio M., Vitali S., Sposini V., Sliusarenko O., Paradisi P., Castellani G., Pagnini G., Centre-of-mass like superposition of Ornstein–Uhlenbeck processes: A pathway to non-autonomous stochastic differential equations and to fractional</p>



	diffusion. <i>Fract. Calc. Appl. Anal.</i> 21, 1420–1435 (2018) Vitali S., Sposini V., Sliusarenko O., Paradisi P., Castellani G., Pagnini G., Langevin equation in complex media and anomalous diffusion. <i>J. R. Soc. Interface</i> 15, 20180282 (2018)
PI in charge:	Dr. Gianni Pagnini (Ikerbasque Research Associate)
Research Line	<i>Statistical Physics</i>
Salary and conditions:	The gross annual salary of the Fellowship is EUR 28.000 - 32.000. It will then be on your own responsibility to make your yearly income declaration at the Bizkaia Treasury Agency. There is a moving allowance for those researchers that come from a research institution outside the Basque Country from EUR 1.000 to EUR 2.000 gross. <i>Free access to the Public Health System in Spain is provided to all employees.</i>
No Positions offered:	#1
Contract duration:	2 years
Deadline:	April 30th, 2019, 12:00 CET (UTC+1)
How to apply:	Applications must be submitted on-line at: http://www.bcamath.org/en/research/job/

Scientific Profile Requested	
Requirements:	<ul style="list-style-type: none"> • Promising young researchers. • Applicant must have completed the PhD before the end of 2019. PhD degree preferable in, but not limited to, Physics, Biology or Mathematics.
Skills and track-record:	<ul style="list-style-type: none"> • Good communication and interpersonal skills. • High-Level Programming (e.g., Python, R). • Low-Level Programming (e.g., C, C++, Fortran). • Ability to effectively communicate and present research ideas to researchers with different background (e.g., mathematicians and biologists). • Ability to present and publish research outcomes in spoken (talks) and written (papers) form. • Good command of verbal and written English.
Scientific Profile:	The preferred candidate will have: <ul style="list-style-type: none"> • Research interest and experience in diffusion



	<p>processes</p> <ul style="list-style-type: none"> • Knowledge of statistical methods and stochastic processes • Knowledge of probability theory, • Ability in Monte Carlo simulations • Basic in Applied Statistics for data-driven techniques
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Application and Selection Process

Formal Requirements:	<p>The selected candidate must have applied before the application deadline online at the webpage http://www.bcamath.org/en/research/job</p> <p>The candidates that do not fulfil the mandatory requirements will not be evaluated with respect to their scientific profile.</p>
Application:	<p>Required documents:</p> <ul style="list-style-type: none"> ▪ CV ▪ Letter of interest ▪ 2 recommendation letters ▪ Statement of past and proposed future research (2-3 pages)
Evaluation:	<p>Based on the provided application documents of each candidate, the evaluation committee will evaluate qualitatively: The adaption of the previous training and career to the profile offered, the recommendation letters, the main results achieved (PhD thesis, papers, proceedings, etc.) and other merits; taking in account the alignment of these items to the topic offered.</p>

Incorporation:	<p>SEPTEMBER – DECEMBER 2019, or as soon as possible thereafter.</p> <p><i>The BCAM postdoctoral contract will start when the selected candidate has finished the PhD, i.e. after dissertation defence.</i></p>
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